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10001	8/1/2007	3 gallons	Styrene	Tank Farm	Flexible line connected to pilot plant styrene supply pump developed a pinhole leak.	Pinhole leak in flex line that was connected to the pilot plant styrene pump.	All valves for flex line were closed immediately. Soil excavated and disposed of off-site. Hose had been hydro tested in May of 2007. Replaced leaking hose.	None	FHRPRU002999-FHRPRU002999	N/A
10004	12/28/2008	0.5 gallon	Styrene	Tank farm concrete containment area	A flex line on the styrene recirculation pump in the tank farm was leaking to the tank farm concrete containment.	Equipment failure—leaking flexible spool piece on flex line.	The pump was isolated and absorbent pads were applied to contain the spill. The flexible spool piece was replaced.	None	FHRPRU003000-FHRPRU003010	N/A
30010	4/26/2009	12 gallons	Styrene	Building 4	An operator was adding styrene to R-18's catalyst tank by holding open the dead man's switch. Operator looked away for a moment and the tank overflowed spilling styrene on the 6th and 5th floors in Building 4.	Operator error.	Operators were instructed to not fill the catalyst tanks to the top.	None	FHRPRU003249-FHRPRU003250	N/A
30883	5/29/2009	1 gallon	Styrene	Tank Farm concrete containment	Approximately 1 gallon of styrene was spilled to the tank farm concrete containment while maintenance work was being performed to remove a stripper hose from a valve on Tank 300.	Operator error.	The valve on Tank 300 was closed prior to the hose being disconnected to minimize styrene discharges. The styrene was cleaned up using absorbents.	None	FHRPRU003000-FHRPRU003010	N/A
37482	3/23/2010	20 gallons	Styrene	Tank Farm concrete containment	Maintenance work was being performed to change out the secondary inlet valve for styrene Tank 300. During the work, the gasket failed, allowing approximately 20 gallons of styrene to spill onto the tank farm concrete containment area.	Operator error.	The gasket and bolts were immediately installed to mitigate leak. The styrene was absorbed with spill clean-up material and was placed into a waste drum. A blind and valve were installed on the bottom of the styrene barge unloading line to help facilitate pipe drainage. New job plans were developed for preparing the styrene barge unloading line for maintenance work. Proper line breaking procedures were reviewed with maintenance technicians.	None	FHRPRU003258-FHRPRU003262	N/A
48377	4/14/2011	5 lbs	Styrene	Pilot plant concrete emergency containment area	The DCS at the facility failed to control the overheating of reactor LR04 at the Pilot Plant. Styrene vapors went past the condenser and dripped out into the containment area upon condensation. A sheen was observed on the water in the containment area.	Equipment malfunction.	The contents of the emergency containment area were pumped to the facility wastewater treatment facility.	None	FHRPRU003031-FHRPRU003042	N/A

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51219	7/7/2011	0.5 lbs	Steam and Styrene	Pilot plant concrete emergency containment area	Steam and liquid styrene were dripping from Reactor LR04 vent line into the Pilot Plant concrete emergency containment area.	The filter on the cooling water system malfunctioned.	The contents of the emergency containment area were pumped to the facility wastewater treatment facility.	None	FHRPRU003043-FHRPRU003054	N/A
53697	9/19/2011	16 ounces	Styrene	Tank Farm concrete containment	The vent condenser on top of styrene storage Tank 300 was found to be dripping small amounts of styrene on to the concrete surface.	Excessive styrene transfer rate by contractor.	Absorbent pads were placed on the area of the spill to recover styrene on the surface. The used pads were placed into a waste drum and disposed of.	The contractor offloading the barge was Midwest Tankerman.	FHRPRU003043-FHRPRU003054	N/A
53548	9/20/2011	5 gallons	Stormwater and styrene	River dock manhole	An alarm was received indicating a leak from the underground styrene unloading line. Upon inspection, a styrene odor was observed within the manhole. A quart-size sample was collected and approximately 3 ounces of styrene was observed.	Flange failure / Equipment Failure.	The contents of the manhole were transferred into 55-gal drums and shipped off-site for disposal.	Hayes Mechanical was hired to repair the styrene line.	FHRPRU003279-FHRPRU003285	Yes
72464	1/4/2013	Unknown	Styrene	Building 4	Maintenance activities were being completed on reactor 14 to change out the automatic styrene valve. While conducting a controlled line break, styrene began leaking out of the line and onto the surrounding area on the 5th floor in building 4.	Styrene had not completely drained out of the line into the reactor prior to the line break.	Maintenance work stopped and all styrene was drained into the reactor. The surrounding area was cleaned with absorbents and placed into a waste drum for disposal.	None	FHRPRU003303-FHRPRU003303	N/A
71677	1/10/2013	Unknown	Ethylbenzene and Polystyrene	Pilot Plant	While cleaning out polystyrene in reactor 4, an operator discovered ethylbenzene leaking out of the reactor insulation jacket.	Loose reactor baffle bolts.	The leak was cleaned with absorbents and a drum was placed underneath the leak. The clean-out was stopped. The reactor baffle bolt was tightened.	None	FHRPRU003304-FHRPRU003308	Yes
74679	4/8/2013	102 gallons	Styrene	Building 4 Pipe rack	Styrene from a styrene supply line sprayed from a flange. A 6 foot by 8 foot area of road pack and a 20 foot by 50 foot of asphalt was impacted with styrene.	Building 4 styrene supply line was improperly drained of residual styrene.	Spilled styrene was absorbed before reaching any storm sewers. FHR remediated the spill area. New procedures were developed for preparing the styrene line for maintenance activities.	Koch Remediation and Environmental Services and Weston Solutions were hired for the remediation work. Prairie Analytical and TestAmerica were the laboratories used for waste analysis.	FHRPRU003313-FHRPRU003495	Yes
92343	5/22/2014	Unknown	Polystyrene, absorbents, wastewater, styrene	Packout	A gaylord box containing absorbent materials contaminated with polystyrene, fire foam, water, and styrene from a contractor's vacuum truck was found dripping onto the floor inside the Packout warehouse. The waste was generated from cleaning out the wastewater treatment plant material containment area.	Leaking gaylord box.	The waste was containerized into 55-gallon drums and shipped off-site for disposal. A discussion was held with the contractor on proper waste handling procedures.	Eagle Services was hired to clean out the wastewater containment area.	FHRPRU004159-FHRPRU004165	Yes

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93328	6/21/2014	10 gallons	Water, fire foam, trace styrene	Southside of Building 4	The rear manway on a frac tank was found to be leaking to asphalt while it was being filled with a water, fire foam, and trace styrene mixture.	Non-sealed manway.	The frac tank loading was halted and all connections and manways on the container were tightened. Absorbent materials were used to clean the affected area.	None	FHRPRU004183-FHRPRU004183	N/A
97241	9/21/2014	50 gallons	Styrene and water	Wastewater Treatment Concrete Material Holding Containment	Maintenance technicians were decanting water off styrene Tank 200 and were transferring the liquid into the concrete holding containment at the wastewater treatment plant. During the decanting process, styrene was inadvertently transferred into the concrete containment and was then pumped into the facility wastewater surge tank.	Operator error.	The wastewater treatment plant was put into recirculation mode and the entire wastewater treatment plant was emptied into frac tanks. The wastewater was disposed of offsite. The system was cleaned prior to being put back into service. A styrene tank decanting procedure was developed.	Eagle Services was hired to clean the wastewater treatment plant.	FHRPRU004184-FHRPRU004282	Yes
119892	2/5/2016	4 ounces	Styrene and Polystyrene	Building 4	An operator was taking a reactor sample and dripped a small amount of styrene and polystyrene onto the concrete floor in Building 4.	Operator error.	Absorbent pads were used to clean the area and then disposed of.	None	FHRPRU004284-FHRPRU004284	N/A
141829	7/6/2017	1 quart	Waste lab solvent mixture (Toluene, Tetrahydrofuran, and Methylene Chloride)	Waste Central Accumulation Area Concrete Containment	Material was released from a pinhole leak on a 30-gallon drum of waste lab solvent.	Pinhole leak on waste drum.	Absorbent pads were immediately placed on the liquid. The concrete secondary containment was cleaned, and the 30-gallon waste drum was placed into a 55-gallon overpack container. The secondary containment contained all liquid and there was no discharge to the facility's storm water sewer system. All absorbent materials were properly disposed of in accordance with the facility's waste management procedure.	None	FHRPRU004300-FHRPRU004302	Yes

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148114	10/20/2017	75 gallons	Styrene	Flare building and storm water retention pond	A building 4 process upset caused styrene to enter the facility's flare building seal pots and pump system. The flare building is located adjacent to the storm water retention pond. When maintenance work was being performed to clean the flare building, styrene spilled onto the asphalt between the building and storm water retention pond. Absorbent pigs and pads were placed around the storm water retention pond to prevent styrene from entering, however, it is estimated approximately 25 gallons entered the pond and 50 gallons was absorbed by the absorbent materials and asphalt.	Flare building seal pots and pumps.	The storm water retention pond discharge valve was in the closed position and no styrene was discharged to the river. Absorbent pads, pigs, and granular absorbent materials were placed inside and outside the flare building to absorb the styrene. An oil absorbing boom spanning the width of the storm water retention pond was placed in the pond to absorb styrene on the surface. A vacuum truck was used to remove the styrene sheen on the surface of the storm water retention pond and the remainder of the pond's water was pumped to the facility's wastewater treatment plant. An industrial cleaning contractor was used to clean the retention pond. The styrene contaminated asphalt outside the flare building was excavated and new concrete was poured. All absorbent materials and asphalt were disposed of with the waste flammable solids that were generated from the event.	Eagle Services was hired to assist with clean-up efforts and Rose Concrete poured the new concrete pad.	FHRPRU004303-FHRPRU004352	Yes
148325	10/25/2017	1 quart	Styrene	Storm water retention pond	Employee noticed sheen on the storm water retention pond. A rain event from the day before caused the residual styrene on the asphalt from the October 20th, 2017 incident to enter the storm water retention pond.	Residual styrene on asphalt outside flare building.				
148378	10/27/2017	1 cup	Styrene	Storm water retention pond	Employee noticed sheen on the storm water retention pond.	Residual styrene on asphalt outside flare building.				
148462	10/27/2017	0.5 gallons	Styrene and water	East of shipping and receiving	Three roll-off containers were dripping at the back-door seam. Small tears in the containers' secondary containments allowed the leaking liquid to form a small puddle outside the containments. The roll-offs contained absorbent, polystyrene, water, and styrene.	Leaking roll-off container and tear in secondary containment.	Absorbent pads were used to absorb the liquid that had leaked out of the secondary containments. A contractor with a vacuum truck removed the liquid in the containments and removed the gravel that had contacted the liquid. The roll-offs were placed into new containments. Drip pans were placed into the new secondary containments along the roll-off door seams. New roll-offs were brought to the facility and the waste was transferred from the leaking roll-offs. No water or styrene sheen entered the facility's storm water sewer system. All absorbent materials were properly disposed of in accordance with the facility's waste management procedure.	Eagle Services was hired to clean the surrounding areas.	FHRPRU004303-FHRPRU004352	Yes

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148609	11/2/2017	1 cup	Styrene	Storm water retention pond	Employee noticed sheen on the storm water retention pond. A rain event from the day before caused the residual styrene on the asphalt from the October 20th, 2017 incident to enter the storm water retention pond.	Residual styrene on asphalt outside flare building.	Reference Item Number 148114 for item mitigation and prevention.	Eagle Services was hired to clean the surrounding areas.	FHRPRU004303-FHRPRU004352	Yes
152595	2/12/2018	15 lbs	Potassium Persulfate	Technical Development Warehouse	An operator was bringing a pallet of potassium persulfate into the TD warehouse on a fork truck. Employee slightly misjudged the turn and struck the pallet being carried against the concrete post on the south side of the open garage door. The material spilled onto the pallet and concrete floor of the building.	Operator error.	The potassium persulfate was cleaned-up and disposed of.	None	FHRPRU004354-FHRPRU004356	Yes
164476	3/14/2019	2 gallons	Styrene	Tank farm concrete containment	An operator observed a styrene heat exchanger leaking from the gasket. The styrene leaked onto the tank farm concrete containment.	Heat exchanger gasket failure.	A secondary containment was placed underneath the leak and the surrounding area was cleaned with absorbents. The styrene in the heat exchanger was drained into a drum and the gasket was repaired.	John's Service and Sales was hired to assist with the heat exchanger repairs.	FHRPRU004413-FHRPRU004418	Yes
164847	3/31/2019	10 lbs	Potassium Persulfate	Catalyst Storage Building	An operator found potassium persulfate on the concrete floor of the catalyst building. It was discovered that two potassium persulfate 50 lb bags had small tears that released the material.	Small bag tears.	The potassium persulfate was cleaned up and placed into drum for disposal.	None	FHRPRU004419-FHRPRU004420	Yes